

Agilent Ref.: 10981377-4  
Application Serial No.: 10/020,693

### REMARKS

In view of the remarks set forth both in the previous responses and those set forth below, the Examiner is respectfully requested to withdraw the rejections and allow currently pending Claims 37-43 and 46-47 and 49-77.

In the above amendments, Claims 37 and 56 have been amended. Support for these amendments may be found throughout the specification and claims as originally filed. For instance, support for the amendments to Claims 37 and 56 can be found at paragraphs 36 and 40. Claims 73 to 77 have been added. Support for new Claims 73 to 77 can be found at paragraphs 40 and 39. Support for new claim 77 can be found in paragraph 24.

Accordingly, no new matter has been added and entry of the above amendments is respectfully requested.

### Rejections under 35 U.S.C. § 102

Claims 37-43, 46, 47, 49, 50, 52, 53, 56-58, 61-68, 70 and 71 have previously been rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Takauchi *et al.* (U.S. Patent No. 5,453,333).

According to MPEP § 2131, a claim is anticipated by a reference only if the reference teaches each and every element of the claim.

An element of the rejected claims is a microvalve that comprises a phase reversible material stably associated with a high surface area component wherein both the phase reversible material and the high surface area component are present in a flow path.

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The Office asserts that Takauchi discloses a single layer structure that includes a first polymer forming a porous membrane and a second polymer that is positioned within the pores of the first polymer. The Office equates the assembly disclosed in Takauchi with the microvalve claimed by the Applicants. Specifically, the Office equates the first polymer membrane with the high surface area component claimed by the Applicants. The Applicants respectfully disagree. The Applicants contend that the first polymer membrane does not equate with the high surface area component of the Applicants claims and even if it did, it is not present within a flow path as recited in the claims.

Solely in order to advance prosecution, the Applicants have amended the language of the claims to clarify that both the phase reversible material and the high surface area component are present in a flow path. Takauchi, on the other hand, discloses a first polymer membrane with pores. The Office equates the pores in the first polymer membrane with the flow path as claimed by the Applicants. However, because the flow path in Takauchi is formed from a pore in the first polymer membrane, the first polymer membrane is not present within the flow path. Because the first polymer membrane is not present in the flow path, Takauchi does not teach a high surface area component in a flow path and therefore does not teach each and every element of the claimed invention.

Additionally, the Applicants contend that Takauchi does not teach a microvalve. It is well understood in the art that a valve is a device that regulates the flow of a material through the opening, closing and obstructing of a passageway. For instance, see Exhibit A. Accordingly, the microvalve claimed by the Applicants includes a phase reversible material, for instance, a gel that is capable of opening and closing by changing its physical state and becoming more or less porous. Therefore, the microvalve is capable of opening and closing a number of times. See paragraph [0032].

Takauchi, on the other hand, teaches a single layer structure that is to be used in a battery as a separator. The single layer structure disclosed in Takauchi is not capable of opening and closing. Rather, the structure is only configured for closing. The purpose of the single layer structure is for allowing electrolytes in a battery to freely flow between electrodes under normal operating temperatures but to stop electrolytic

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conductivity within the battery once a given high temperature has been reached. See column 3, lines 15-23. The purpose for closing the pores is to prevent electrolytes in the battery from flowing once an abnormally high temperature has been reached and thereby preventing fire or explosion. See column 11, lines 5-10. Hence, the single layer structure is only configured for having the pores of the first polymer material closed by the second polymer material once a high temperature is reached.

The single layer structure is not configured for having the pores of the first polymer material reopened once closed. The reason the pores of the single layer structure are not configured for being reopened once closed is because the single layer structure functions as a safety mechanism to prevent the explosion of a malfunctioning battery. If the pores were capable of being reopened the risk of the malfunctioning battery exploding would not be avoided and the very purpose for which the battery separator was designed would be frustrated. Accordingly, contrary to its characterization by the Office, the single layer structure of the battery separator is not configured for opening and closing and therefore the single layer structure is not a valve.

Because Takauchi does not teach a "micro-valve" capable of opening and closing, it can not be used to anticipate the present invention. Applicants, therefore, respectfully request reconsideration and withdrawal of the 35 U.S.C. § 102(b) rejection of Claims 37-43, 46, 47, 49, 50, 52, 53, 56-58, 61-68, 70 and 71.

#### Rejections under 35 U.S.C. § 103

Claims 54, 55, 59 and 60 have previously been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Takauchi *et al.* (U.S. Patent No. 5,453,333) in view of Hooper *et al.* (U.S. Patent No. 5,569,364).

In order to establish a *prima facie* case of obviousness, each reference alone or in combination must teach or suggest all of the limitations of the claimed invention.

An element of the rejected claims is a microvalve that comprises a phase reversible material stably associated with a high surface area component wherein both

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the phase reversible material and the high surface area component are present in a flow path.

As reviewed above, Takauchi is deficient in at least for failing to teach a microvalve that comprises a phase reversible material stably associated with a high surface area component wherein both the phase reversible material and the high surface area component are present in a flow path. As Hooper has been cited solely for its disclosure of poly(N-isopropylacrylamide) as the second polymer, Hooper fails to remedy the deficiencies of Takauchi.

Accordingly, a *prima facie* case of obviousness has not been established because neither Takauchi nor Hooper teach all the elements of the rejected claims. Therefore, the Applicants respectfully request that the 35 U.S.C. 103(a) rejection of Claims 54, 55, 59 and 60 be withdrawn.

New Claims 73 to 77 depend from and incorporate all the elements set forth in independent base Claim 37. Accordingly, for at least the reasons set forth above new Claims 73 to 77 are non-anticipated and non-obvious.

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### CONCLUSION

Applicants submit that all of the claims are in condition for allowance, which action is requested. If the Examiner finds that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone Bret Field at (650) 833-7770.

The Commissioner is hereby authorized to charge any underpayment of fees associated with this communication, including any necessary fees for extensions of time, or credit any overpayment to Deposit Account No. 50-1078, order number 10981377-4.

Respectfully submitted,

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valve  **Pronunciation Key** (vālṽ)  
n.

1. **Anatomy.** A membranous structure in a hollow organ or passage, as in an artery or vein, that folds or closes to prevent the return flow of the body fluid passing through it.
2.
  - a. Any of various devices that regulate the flow of gases, liquids, or loose materials through piping or through apertures by opening, closing, or obstructing ports or passageways.
  - b. The movable control element of such a device.
  - c. **Music.** A device in a brass wind instrument that permits change in pitch by a rapid varying of the air column in a tube.
3. **Biology.**
  - a. One of the paired, hinged shells of certain mollusks and of brachiopods.
  - b. One of the two silicified halves of the cell wall of a diatom.
  - c. The entire, one-piece shell of a snail and certain other mollusks.
4. **Botany.**
  - a. One of the sections into which the wall of a seedpod or other dehiscent fruit splits.
  - b. A lidlike covering of an anther.
5. **Chiefly British.** An electron tube or a vacuum tube.
6. **Archaic.** Either half of a double or folding door.

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*tr. v.* **valved, valv·ing, valves**

1. To provide with a valve.
2. To control by means of a valve.

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[Middle English, *leaf of a door*, from Latin *valva*. See *wel*-<sup>2</sup> in Indo-European Roots.]

**valve** <sup>1</sup> *less adj.*

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**valve** (vāl·v)

*n.*

1. A membranous structure in a hollow organ or passage, as in an artery or a vein, that folds or closes to prevent the return flow of the body fluid passing through it.
2. Any of various devices that regulate the flow of gases, liquids, or loose materials through piping or through apertures by opening, closing, or obstructing ports or passageways.
3. The movable control element of such a device.

Source: *The American Heritage® Stedman's Medical Dictionary*  
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Main Entry: **valve**

Pronunciation: 'vāl·v

Function: *noun*

1 : a structure especially in a vein or lymphatic that closes temporarily a passage or orifice or permits movement of fluid in one direction only

2 : any of various mechanical devices by which the flow of liquid (as blood) may be started, stopped, or regulated by a movable part that opens, shuts, or partially obstructs one or more ports or passageways; *also* : the movable part of such a device

Source: *Merriam-Webster's Medical Dictionary*, © 2002 Merriam-Webster, Inc.

**valve**

*n* 1: a structure in a hollow organ (like the heart) with a flap to insure one-way flow of fluid through it  
2: device in a brass wind instrument for varying the length of the air column to alter the pitch of a tone  
3: control consisting of a mechanical device for controlling the flow of a fluid

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<electronics> UK term for a vacuum tube.

(1996-01-10)

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